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The Differential Effects of Parental Involvement on High School Completion and Postsecondary Attendance

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Abstract: Previous studies have shown the impact of parental involvement on a number of student achievement, motivation, and engagement outcomes, but the extent to which parental involvement influences high school completion and postsecondary attendance has received less attention in the literature. Filling that gap, this study replicates and extends previous research (Fan & Williams, 2010) by examining the influence of various dimensions of parental involvement on high school completion and postsecondary attendance (with particular interest in dropouts who later earned GEDs and went on to college). Results show that parents' educational expectations for their children play a significant role in whether students from all backgrounds persist toward completion of high school and whether they attend a postsecondary institution. This study also finds parent participation in school functions to be a significant positive predictor of both high school completion and postsecondary enrollment, while communication between parent and school about

¹ This study is the result of the author's independent research and the views expressed in the study do not necessarily represent the views of the U.S. Department of Education or the United States.

children's school problems is negatively associated with both outcomes. The implications for expanding developmentally appropriate and culturally sensitive policies for family and school engagement are discussed.

Keywords: parental involvement; high school completion; postsecondary attendance

Los efectos diferenciales de la participación de los padres en la asistencia post-secundaria y la finalización de la escuela secundaria

Resumen: Estudios previos han demostrado el impacto de la participación de los padres en una serie de logros de los estudiantes, motivación y resultados de la participación, pero el grado en que la participación de los padres influyen la finalización del secundario y post-secundaria ha recibido menos atención en la literatura. Para atender ese problema, este estudio replica y extiende la investigación anterior (Fan & Williams, 2010) mediante el examen de la influencia de diversas dimensiones de la participación de los padres en la terminación de los estudios y asistencia post-secundaria (con especial interés en los abandonos de estudiantes que más tarde obtuvieron el diploma de finalización GED y que fueron a la universidad). Los resultados muestran que las expectativas educativas de los padres sobre sus hijos tienen un papel importante para que estudiantes de todos los orígenes sociales persistan en la finalización de la escuela secundaria y asistan a una institución de educación superior. Este estudio también revela que la participación de los padres en las actividades escolares puede ser un predictor positivo significativo tanto de la finalización de la escuela secundaria y la matrícula de educación superior, mientras que la comunicación entre padres y escuelas acerca de problemas escolares de los niños se asocia negativamente con ambos resultados. Se discuten las implicaciones para la expansión de las políticas de desarrollo y culturalmente sensibles apropiadas para la participación familiar y escolar.

Palabras clave: participación de los padres; finalización de la preparatoria; asistencia post-secundaria

Os efeitos diferenciais de envolvimento dos pais na conclusão do Ensino Médio e na frequência no Ensino Superior

Resumo: Estudos anteriores demonstraram o impacto do envolvimento dos pais no desempenho do aluno, na motivação e nos resultados da participação, mas em que medida a participação dos pais influenciam a conclusão do Ensino Médio e do Ensino Superior tem recebido menos atenção na literatura. Para resolver este problema, este estudo replica e estende a pesquisa anterior (Fan & Williams, 2010), examinando a influência de várias dimensões de envolvimento dos pais na realização de estudos e de frequência no Ensino Superior (com especial interesse em desistências de estudantes que mais tarde obtiveram certificação em exames supletivos e foram para a universidade). Os resultados mostram que as expectativas educacionais dos pais sobre seus filhos têm um lugar importante para que os estudantes de todas as origens sociais persistam em concluir o ensino médio e frequentem a universidade. Este estudo também revela que o envolvimento dos pais nas atividades escolares pode ser um elemento positivo significativo, tanto da conclusão do ensino médio quanto no ingresso no ensino superior, enquanto a comunicação entre pais e escolas sobre problemas escolares das crianças foi negativamente associado em ambos resultados. As implicações para a expansão das políticas de apropriadas e culturalmente sensíveis para participação familiar e escolar são discutidas nesse artigo.

Palavras-chave: envolvimento dos pais; conclusão do ensino; assistência pós-secundário

Introduction

Guiding students toward high school completion and college enrollment are major goals of the U.S. education system. The individual and societal benefits of higher education, including higher earnings and employment rates, greater job satisfaction and social mobility, healthier lifestyles, and more active citizens, to name a few, are well documented in the literature (e.g., Baum, Ma, & Payea, 2013; Brand & Xie, 2010; Kenkel, 1991; Ou, 2008; Pew Research Center, 2014). For example, in a longitudinal study of high school sophomores in 2002, some 26% of those with less than high school completion in 2012 were unemployed, compared to 15% of those with a high school diploma or general educational development (GED) credential and 5% of those with a bachelor's degree or higher (Lauff & Ingels, 2013). In terms of income, 7% of those with less than high school completion earned an income of \$40,000 or more from employment, compared to 14% with a high school diploma or GED and 33% of those with a bachelor's degree or higher. Receiving public assistance also differentiated the three groups as 47% of cohort members with less than high school completion had received public assistance in 2011, compared to 32% of those with a high school diploma or GED and 5% of those with a bachelor's degree or higher. These statistics are not surprising, given that federal agencies, such as the Bureau of Labor Statistics (BLS) and the U.S. Department of Education, have reported similar patterns for many years (BLS, nd; Kena et al., 2015).

Given these large disparities by educational attainment, factors that lead to the decision to drop out of school have been studied extensively (e.g., Alexander, Entwisle, & Horsey, 1997; Battin-Pearson et al., 2000; Dynarski & Gleason, 1999; Fan & Wolters, 2014; Henry, Knight, & Thornberry, 2012; Neild, Stoner-Eby, & Furstenberg, 2008; Rumberger & Larson, 1998). Student risk factors include living in a single parent household, being economically disadvantaged, and experiencing grade retention, limited English proficiency, emotional and/or behavioral disorders, and learning disabilities, to name a few. However, studies have also found that, when asked, students cite a number of school, family, and work-related reasons for dropping out of school (e.g., Malkus & Sen, 2012), resulting in the need for multiple approaches to address this problem. In particular, the National Dropout Prevention Center/Network (NDPC/N), a well-known and respected clearinghouse for research in this area, promotes 15 strategies shown to be effective at reducing dropout behavior. These strategies range from early interventions, such as increasing preschool participation and family engagement, to making the most of instruction, by providing professional development for teachers of at-risk youth (for more information, see <http://dropoutprevention.org/effective-strategies/>).

Disengagement from school is not only of interest to researchers and practitioners, but also to policymakers who are working to both understand and find solutions to this problem, which disproportionately impacts some student populations (e.g., minorities and low-income students), compared to others. There is strong agreement among federal policymakers that an important part of any strategy to reduce dropout rates (overall and particularly among vulnerable subgroups), is for school leaders to improve family-school relations and increase parental involvement in education (e.g., deCastro & Catsambis, 2009; Hill & Chao, 2009; Hill, Tyson, & Bromell, 2009; Hoover-Dempsey, Ice, & Whitaker, 2009; 107th Congress, 2002). In particular, the 2002 reauthorization of the Elementary and Secondary Education Act (ESEA), better known as the No Child Left Behind Act (NCLB; 107th Congress, 2002), mandated that states seeking funding for Title I (i.e., low-income) schools identify and implement practices for involving parents that are “based on the most current research that meets the highest professional and technical standards, on effective parental

involvement that fosters achievement to high standards for all children.” (Section 1111.d). The 2015 reauthorization, known as the Every Student Succeeds Act, or ESSA, maintains this commitment to parent and family engagement activities (114th Congress, 2015). Hence, the effect of parental involvement on student achievement and dropout behavior is of continuing interest to practitioners and policymakers alike.

Parental Involvement during the Adolescent Years

The belief that children benefit from their parents’ involvement in school-related activities is supported by research, particularly studies of the impact of parental involvement on students’ academic outcomes, behavior, motivation, engagement, and self-efficacy (e.g., Domina, 2005; Fan & Williams, 2010; Jeynes, 2005). However, research also shows a steady decline in parental involvement once children reach the middle and high school years (e.g., Eccles et al., 1993; Epstein & Dauber 1991; Spera, 2005; U.S. Department of Education, 1998). During this time, adolescents begin to express a desire for more independence and autonomy – feelings that are reinforced by the changes in school structure and expectations for independent work that students encounter in secondary school settings (Epstein & Sanders, 2002). Unfortunately, using developmentally appropriate strategies to help adolescents successfully transition from elementary to middle (or from middle to high) school does not appear to be a widespread practice. Rather, middle and high school programs aimed at increasing parental involvement are often uninformed by research and best practice for how to effectively collaborate with parents to support adolescent achievement (Hill & Chao, 2009). At the same time, there is less research evidence on the effects of parental involvement for secondary school outcomes than there is for elementary school outcomes. Thus, not only is it challenging to find ways to keep parents involved during these years, but a greater understanding of the relationship between parental involvement and secondary outcomes – such as high school completion and postsecondary attendance – is also needed.

Parental Involvement and Student Outcomes

Studies have shown the positive impact of parental involvement on a number of proximal and distal student outcomes, including reading and mathematics achievement (Jeynes, 2005; Sheldon & Epstein, 2005; Sirvani, 2007; Sui-Chu & Willms, 1996; Yan & Lin, 2005), student behavior in school (Domina, 2005), school attendance, preparation for class, and course completion (Simon, 2001), student motivation, academic self-efficacy, and engagement (Fan & Williams, 2010; Gonzalez-DeHass et al, 2005), and middle school dropout behavior (Rumberger, 1995). However, not all parental involvement activities have positive effects (Domina, 2005; Fan, 2001; Izzo, Weissberg, Kasprow, & Fendrich, 1999). For example, in an early childhood education study, the quality of parent-teacher interactions predicted improvements in student achievement and behavior but frequent parent-teacher contact was associated with declines in acceptable classroom behavior (Izzo et al., 1999). In Fan’s (2001) study, parents’ aspirations for their children’s educational attainment exceeded all other aspects of parental involvement in predicting middle school students’ academic growth, even after controlling for socioeconomic status (SES). However, some parental involvement behaviors (e.g., education-related communication with child, volunteering at child’s school) were not as consistently predictive of student academic growth, and others (e.g., frequent contact with child’s school) had negative effects on student achievement. Another study on the influence of parental involvement on student achievement of elementary school children found that the statistically significant positive effects of activities such as volunteering at school, and checking

and helping children with homework actually become nonsignificant (and even negative), after controlling for children's prior academic achievement and school and family background characteristics (Domina, 2005). Clearly, more research is needed to replicate and extend the findings in this area and to examine outcomes (e.g., high school completion and postsecondary attendance) for students at higher levels of education than elementary and middle school, where much of the existing research is focused.

Parental Involvement Differences by Race/Ethnicity and SES

Previous research has also examined parental involvement across racial/ethnic groups; however, the evidence is mixed at best. While overall, it may appear that parents of black and Hispanic youth are less involved than white parents (e.g., Yan & Lin, 2005), some studies show – after controlling for other background variables – that black and Hispanic parents may often be more involved than White parents in the education of their children (e.g., Sui-Chu & Willms, 1996). Still, other studies show no differences by race/ethnicity at all (e.g., Hill et al., 2004). Additionally, research on the effectiveness of parental involvement across different socioeconomic groups is also inconclusive. That is, well-educated and affluent parents tend to draw on their experiences and understanding of education processes and operations to both advocate for their children and engage in practices that align with school efforts. However, research has also shown those same practices may be observed among less-educated/lower-income parents, once they are taught how to navigate the complex system of American schools and how to support their children in ways that promote academic success (Nicolau & Ramos, 1990; Olivos, 2006; Smith, Robbins, Stagman, & Mahur, 2013). Further, varying cultural perceptions of parent and teacher roles, as well as language differences and school and community barriers to parental involvement, may also contribute to differences in parental involvement by race/ethnicity and SES. For example, in many Spanish-speaking countries, teachers and school leaders are viewed as education experts, and therefore many Hispanic parents in the U.S. (both native and foreign-born) may defer to, rather than question or oppose, school officials when making decisions for their children (deCastro & Catsambis, 2009). Unfortunately, this kind of behavior can be mistaken for apathy on the part of parents who may just be less comfortable than other parents when it comes to directing their children's education. In this, and possibly other ways, existing theory and research are somewhat limited in explaining apparent differences between racial/ethnic and socioeconomic groups, which can hinder efforts to develop positive parent-school relationships.

Dimensions and Types of Parental Involvement

Another challenge to measuring parental involvement is that there is no consistent definition of what it entails. In general, researchers agree that parental involvement encompasses a whole host of activities and behaviors that promote the academic and social success of one's children (Fishel & Ramirez, 2005) and that it is better understood as a multidimensional construct (Epstein, 1995; Fan & Williams, 2010; Grolnick & Slowiaczek, 1994). Epstein (1995) – one of the most widely cited researchers to first suggest a multidimensional framework for parental involvement – ultimately conceptualized it as six types of activities that are essential to a comprehensive program of a family, school, and community partnership: (1) parenting, (2) communicating, (3) volunteering, (4) learning at home, (5) decision making and (6) collaborating with the community. According to Epstein, students are best served when schools help families establish supportive home environments for learning, provide two-way systems of communication about school programs and student progress,

actively recruit and organize help from parents, facilitate at-home learning, involve parents from all race and socioeconomic backgrounds as representatives and leaders on school committees, and identify and effectively integrate community resources to strengthen school programs. Obviously, these practices, when implemented, are meant to more deeply engage parents in the school community than simply providing information through newsletters and progress reports. Other researchers (e.g., Henderson, 2002; Olivos, 2006) share this perspective, noting that authentic programs for increasing school-family engagement will recognize and value differences in the ways that parents – especially those of diverse racial/ethnic groups – interact with their children’s schools.

While Epstein (1995) and others (e.g., Singh, Bickley, Trivette, Keith, & Keith, 1995) developed theories based either on their intuition about what should logically constitute parental involvement or by analyzing the content of questionnaire items, Fan (2001) was one of the first to empirically test these theories and demonstrate – through exploratory factor analysis and latent growth curve analysis – the existence of multiple and distinct dimensions of parental involvement and their effects on students’ academic growth in high school. Using 14 survey items related to parental involvement from NCES’ National Education Longitudinal Study of 1988 (NELS:88), Fan identified seven dimension of parental involvement: (1) TV rules, (2) Communication, (3) Contact with School, (4) PTA, (5) Volunteer, (6) Supervision, and (7) Education Aspiration. Fan’s study found comparable levels of parental involvement across racial/ethnic groups and that parents’ aspirations for their children’s educational attainment was a consistent and positive predictor of students’ academic growth in reading, mathematics, science and social studies from 1988 to 1992.

More recently, Fan and Williams (2010) used a similar approach as Fan (2001) in examining the differential effects of eight parental involvement dimensions on student motivation, academic self-efficacy, and engagement in a nationally representative sample of high school sophomores. The dimensions studied included: (1) parental aspirations for their children’s educational attainment, (2) parent participation in school functions, (3) family rules reflecting parental home supervision, (4) parental advising, (5) parent participation in their children’s extracurricular activities, (6) parent-school communication regarding children’s problems at school, (7) school-initiated contact with parents regarding benign school issues, and (8) parent-initiated contact with schools regarding benign school issues. In this later study, Fan and Williams (2010) separated parent-school communications regarding children’s problems at school from parent-school communications regarding benign issues in order to examine the negative relationship between parent-school communication and student academic outcomes (i.e., behavior and achievement) uncovered in earlier studies (Fan, 2001; Izzo et al., 1999). Also, Fan and Williams separately examined parent-initiated and school-initiated contact regarding benign school issues as a way of investigating the differential effects of each on student motivation, academic self-efficacy, and engagement. Their results demonstrated – once again – the powerful association between parents’ educational aspirations for their children and student academic outcomes. Parent aspirations and school-initiated contact with parents showed strong positive effects on students’ school engagement and their intrinsic motivation and self-efficacy towards mathematics and English. However, similar to previous research, parent-school contact regarding students’ school problems was negatively associated with all outcomes studied. Finally, parental advising positively predicted students’ academic self-efficacy and intrinsic motivation in English, while family rules for watching television positively predicted students’ intrinsic motivation and engagement towards mathematics and English.

Parental Involvement, High School Completion, and Postsecondary Attendance

All of the above cited studies show the effects of parental involvement – whether positive or negative – on a number of student achievement, motivation, and engagement outcomes. However, the extent to which specific parental contact and involvement practices influence middle and high school completion and postsecondary attendance has received less attention in the literature. Rumberger's (1995) study on the differential effects of parental involvement activities on middle school dropout behavior is a notable exception. He found that the most powerful parental involvement factors – among those studied – were the extent to which parents participate in school parent-teacher organizations and act as volunteers at their child's school. Students with less academic support and supervision were 34% more likely to drop out than other students. Also, students whose parents had low educational expectations for them (i.e., only expecting high school graduation) were more than five times as likely as other students to drop out of school in the eighth grade. Additionally, Ross et al (2012) investigated the effects of a number of variables thought to impact immediate postsecondary enrollment after high school (e.g., GPA, mathematics achievement, previous grade retention, school absenteeism, participation in high school sports and extracurricular activities, discussing coursework with parents, working at a job more than 30 hours per week, and having close friends who dropped out of school). The study showed that, after controlling for various student and family background variables, students who often discussed school courses with their parents had 44% higher odds of immediate enrollment in postsecondary education, compared to those who never had these discussions with their parents. These few studies notwithstanding, more research is needed to understand how parental involvement positively influences secondary school outcomes and how education policies – such as Title I provisions under ESEA – can be leveraged to capitalize on those relationships.

Study Purpose

This study replicates and extends previous research by examining the impact of various dimensions of parental involvement (as defined in Fan & Williams, 2010) on high school completion and postsecondary attendance (with particular interest in dropouts who later earned GEDs and went on to college). This study fills an important gap in the emerging literature on parental involvement and has implications for expanding developmentally appropriate and culturally sensitive policies for family and school engagement. The study answers the following research question:

Are specific dimensions of parental involvement previously shown to impact the likelihood of middle school dropout behavior (Rumberger, 1995) and/or shown to increase high school students' academic self-efficacy, engagement, and intrinsic motivation in mathematics and English (Fan & Williams 2010) similarly associated with high school completion and postsecondary attendance?

The answer to this question may depend – to some extent – on other factors, such as student and family background characteristics. In fact, among a nationally representative sample of high school sophomores in 2002, Malkus and Sen (2012) showed that high school completion status (in 2006) varied by a number of student characteristics. For example, male students and black, Hispanic, and low SES students were more often represented among dropouts than they were among high school graduates or GED recipients. More specifically, Malkus and Sen reported that 49% of high school graduates were male compared to 59% of GED recipients and 60% of dropouts. In terms of race/ethnicity, 13% of high school graduates were Black, compared to 16% of GED recipients and 18% of dropouts. The percentages for Hispanic/Latino high school graduates,

GED recipients, and dropouts were 14%, 16%, and 33%, respectively. That study also reported that 22% of high school graduates were from the lowest socioeconomic status quartile, compared to 35% of GED recipients and 55% of dropouts who also came from low-income families. Furthermore, parental involvement has been shown to vary by race/ethnicity, socioeconomic status, and family structure (Aston & McLanahan, 1991; Desimone, 1999; Zellman & Waterman, 1998). Given these findings, this study controls for the influence of student and family background variables (i.e., race/ethnicity, sex, and family income).

Methodology: Data, Measures, and Analysis

Data

To replicate and extend the analysis conducted in Fan & Williams (2010), I used data from the Education Longitudinal Study of 2002 (ELS: 2002), a nationally representative study of tenth graders in 2002 and 12th graders in 2004 and which followed the cohort through 2012, when most members would have been approximately 26 years old (Lauff & Ingels, 2013). ELS: 2002 – one of many school-based longitudinal studies conducted by the National Center for Education Statistics (NCES) – followed students as well as high school dropouts, monitoring their transitions to postsecondary education, the labor force, and family formation. The four rounds of data collection on this cohort of high school sophomores include the base year in 2002, the first follow-up in 2004, the second follow-up in 2006, and the third follow-up in 2012.

In addition to collecting information from the cohort, ELS includes data from questionnaires administered to the students' parents, teachers, librarians, and school administrators. The base year (2002) sample included 16,197 tenth graders, weighted to represent the approximately 3 million high school sophomores enrolled in U.S. schools. Among those sampled, 15,362 students and 13,488 parents completed questionnaires. In the weighted sample, 50.0% of students were female and 50.0% were male; 60.3% were White, 15.9% were Hispanic/Latino, 14.4% were Black, 4.2% were Asian/ Pacific Islander, 1.0% were American Indian/Alaska Native, and 4.3% were of two or more races (Ingels, Burns, Chen, Cataldi, & Charleston, 2005). All four rounds of data collection achieved weighted response rates of 84% and above. Nonresponse bias analyses were conducted at each round to adjust for nonresponse so that the data could be used with confidence. During this process, NCES identified 78 high-nonresponse student questionnaire variables in the dataset. Among these variables, the nonresponse bias analysis detected a bias of 5% or higher in less than one half of 1% of the observations. For more information on the nonresponse bias analysis, and other possible limitations of the dataset, see the ELS data file documentation (Ingels et al., 2014).

Similar to previous NCES longitudinal studies, ELS: 2002 surveyed parents about specific activities they engage in with their tenth grader. The availability of multiple items related to parental involvement makes it possible to examine how the various dimensions of parental involvement may affect student outcomes, including high school completion and postsecondary attendance.

Measures: Parental Involvement Variables

The types of parental involvement I examine here include (1) parent participation in their children's extracurricular activities, (2) parental advising, (3) parent-school communication regarding children's problems at school, (4) school-initiated contact with parents regarding benign school issues, (5) parent-initiated contact with schools regarding benign school issues, (6) parent

participation in school functions, (7) parental aspirations for their children's educational attainment, and (8) family rules reflecting parental home supervision. In the base year of ELS: 2002, parents responded to questionnaire items asking about various activities that they had engaged in with their child or their child's school. The selected questionnaire items for this study are those used to represent the eight dimensions of parental involvement, as defined by Fan and Williams (2010). These items are similar to those used in a number of empirical studies and have been shown to have acceptable reliability and validity (e.g., Fan, 2001; Hill & Craft, 2003; Yan & Lin, 2005). Table 1 provides a list of the items I used to measure each parental involvement dimension (including the internal consistency estimates reported in Fan & Williams, 2010). The parental aspiration dimension is a composite variable that NCES created (and imputed using a weighted sequential hot deck procedure) for the ELS: 2002 dataset. Unfortunately, the family rules dimension, composed of items measuring the extent to which parents reported having four specific rules for their tenth-grader (i.e., maintaining a certain grade average, doing homework, doing household chores, and watching television) did not exhibit adequate internal consistency (Cronbach's $\alpha = .59$) in the Fan and Williams (2010) study. Therefore, in this study, I – like Fan and Williams (2010) – treated the four variables separately in the analyses.

Table 1

Selected ELS: 2002 Questionnaire Items Used to Measure 7 Dimensions of Parental Involvement

Dimension	Questionnaire Items
Parent participation in extracurricular activities with children (Cronbach's alpha = .76)	Looking back over the past year, how frequently did you and your tenth grader participate in the following activities together? (1 = Never, 2 = Rarely, 3 = Sometimes, 4 = Frequently) Attending concerts, plays, or movies outside of school (BYP57C) Attending sporting events outside of school (BYP57D) Attending family social functions (party, wedding) (BYP57F) Taking day trips or vacations (BYP57G) Working on a hobby or playing sports (BYP57H) Going to restaurants/eating out (BYP57J) Doing something else fun together (BYP57L)
Parental advising (Cronbach's alpha = .77)	In the first semester or term of this school year, how often have you and/or your spouse/partner provided advice or information about the following to your tenth grader? (1 = Never, 2 = Sometimes, 3 = Often) Selecting courses or programs at school (BYP56A) Plans and preparation for college entrance exams such as ACT, SAT, or ASVAB (BYP56B) Applying to college or other schools after high school (BYP56C) Specific jobs your tenth grader might apply for after high school (BYP56D) Community, national, and world events (BYP56E) Things that are troubling your tenth grader (BYP56F)
Parent-school communication concerning children's school problems (Cronbach's alpha = .76)	Since your tenth grader's school opened last fall, how many times have you or your spouse/partner been contacted by the school (or you or your spouse/partner contacted the school) about the following? (1 = None, 2 = Once or twice, 3 = Three or four times, 4 = More than four times) Your tenth grader's poor performance in school (BYP52A and BYP53A) Your tenth grader's problem behavior in school (BYP52F and BYP53F)
School-initiated contact with parents and Parent-initiated contact with school (Cronbach's alpha = .65 and .71, respectively)	Since your tenth grader's school opened last fall, how many times have you or your spouse/partner been contacted by the school (or you or your spouse/partner contacted the school) about the following? (1 = None, 2 = Once or twice, 3 = Three or four times, 4 = More than four times) Your tenth grader's school program for this year (BYP52B and BYP53B) Your tenth grader's plans after leaving high school (BYP52C and BYP53C) Your tenth grader's course selection for entry into college, vocational, or technical school after completing high school (BYP52D and BYP53D) Information on how to help your tenth grader at home with specific skills or homework (BYP52I and BYP53I)

Table 1 continued

Selected ELS: 2002 Questionnaire Items Used to Measure 7 Dimensions of Parental Involvement

Dimension	Questionnaire Items
Parent participation in school functions (Cronbach's alpha = .72)	In this school year, do you or your spouse/partner do any of the following? (0 = No, 1 = Yes) Belong to the school's parent-teacher organization (BYP54A) Attend meetings of the parent-teacher organization (BYP54B) Take part in the activities of the parent-teacher organization (BYP54C) Act as a volunteer at the school (BYP54D) Belong to any other organization with several parents from your tenth grader's school (for example, neighborhood or religious organizations) (BYP54E)
Parental aspirations for children's postsecondary education	How far in school the parent wants their tenth grader to go (BYPARASP) 1 = Less than high school graduation 2 = High school graduation or GED only 3 = Attend or complete 2-year college/school 4 = Attend college, 4-year degree incomplete 5 = Graduate from college 6 = Obtain master's degree or equivalent 7 = Obtain PhD, MD, or other advanced degree
Family Rules	Are there family rules that are enforced for your tenth grader about any of the following activities? (0 = No, 1 = Yes) Maintaining a certain grade average (BYP69A) Doing homework (BYP69B) Doing household chores (BYP69C) Watching television (BYP69D)

Measures: Student and Family Background Variables

The student and family background variables I used in this analysis include sex, race/ethnicity, and socioeconomic status (SES). For all three of these variables, missing values were imputed by NCES before releasing the ELS: 2002 dataset. Sex was constructed from the base-year student questionnaire and when missing, NCES determined sex using the school roster or by logical imputation using the student's first name. Race/ethnicity was also self-reported and imputed by NCES using similar procedures as for the sex variable. For the current study, I used the following six race categories: White, American Indian/Alaska Native, Asian/Pacific Islander, Black, Hispanic, and two or more races. With the exception of the Hispanic category, all race categories exclude students of Hispanic or Latino origin. The variable I used to describe students' SES is a composite variable within the ELS dataset that NCES constructed from five component variables: father's education level, mother's education level, family income, father's occupation, and mother's occupation. Data for all five components were collected on the parent questionnaire and imputed

when missing. For more information on NCES imputation procedures, see the ELS data file documentation (Ingels et al., 2014).

Measures: Dependent Variables

In this study, I examine the effects of various parental involvement behaviors on two educational outcomes – high school completion (either through high school diploma or GED) and postsecondary attendance by 2006. High school completion was measured by NCES using self-reported data from the second follow-up student questionnaire in 2006. Where missing, data from transcripts or the first follow-up questionnaire in 2004 were used. Postsecondary attendance status was taken from the second follow-up student questionnaire, and is based on students' self-report of whether they had ever attended a postsecondary institution since high school. Where missing, NCES provides imputed data in the ELS: 2002 dataset.

Analysis

Similar to Fan and Williams (2010), the current study accounts for the complex, two-stage (i.e., school selection, followed by student selection) sampling design employed by ELS: 2002. I applied the full sample weight (F2BYWT) to all estimates and used Taylor-linearized variance estimation (using primary sampling unit and strata weighting) to produce unbiased estimates of the standard errors reported in this paper. The Taylor series approximation technique makes appropriate adjustments for participant nonresponse and unequal probabilities of selection – two complex survey issues that can seriously affect variance estimation, if not adequately addressed. I conducted all of the analyses using complex survey (i.e., SVY) commands within the STATA 13 statistical software package (StataCorp, 2013) and I included appropriate weights (at the stratum, cluster, and student level) to adjust for nonresponse and the unequal probability of selection associated with ELS: 2002.

As is common with many large-scale data sets, ELS: 2002 contains missing data across a number of variables, including the parental involvement questionnaire items involved in this study. The amount of missing data (across all variables in this study) ranged between 0.2% and 25.9% (unweighted), which is large enough to warrant closer attention (Graham & Hofer, 2000). Fortunately, there are many options for addressing missing data, such as traditional methods of listwise or pairwise deletion, means substitution, etc. However, these approaches can result in drastic reductions in sample size and do not account for nonrandom missing data. The risks of producing biased estimates using these methods – and the advantages of other approaches, such as multiple imputations – are well-documented (Baraldi & Enders, 2010; Fichman & Cummings, 2003; Howell, 2007; Little & Rubin, 1987; Rubin, 1987).

To avoid some of the issues associated with these approaches, in this study I employed sequential regression multivariate imputation (SRMI) to generate five sets of imputed data for the analysis. SRMI is a flexible technique that can handle variables of different types (e.g., categorical, continuous) when selecting appropriate regression models to predict missing data. Another advantage is that SRMI makes use of all of the information in a dataset, when imputing data for each missing value. I conducted the SRMI method using the “mi impute chained” command in STATA 13, which supports multivariate imputation using chained equations (ICE). For more information on the SRMI procedure, see Raghunathan, Lepkowski, Van Hoewyk & Solenberger (2001).

After creating the parental dimension scales from the individual questionnaire items, I employed the mi impute chained procedure in STATA 13 to produce the five imputed datasets.

Then, I performed descriptive analyses to describe various characteristics and outcomes for the sample.

To study the effects of parental involvement on high school completion via diploma or GED certificate, I conducted logistic regression analyses using data for the entire cohort of sophomores in 2002 and then separately on the subpopulation of non-diploma recipients (primarily sophomores who dropped out of high school at some point between the base year and second follow up data collections in 2002 and 2006, respectively). To study the effects of parental involvement on college-going by 2006, I performed similar analyses for the sophomore cohort and the subpopulation of non-diploma recipients. Additionally, I conducted each logistic regression analysis across the five imputed datasets using the “mi estimate: svy” command in STATA 13. In the analyses, I controlled for student and family background variables, namely sex, race/ethnicity, and SES.

Unless otherwise indicated, study results are based on imputed data from the five generated datasets. Only statistically significant differences are highlighted in the comparisons. However, STATA’s mi estimate command does not support t-tests for comparing estimates with imputed data. Therefore, in the descriptive analysis of means and percentages, I compared the 95% confidence intervals for each of the parental involvement variable estimates. I present standardized regression coefficients for the multivariate analyses.

Results

Table 2 shows the weighted, non-imputed, percentage of spring 2002 tenth graders, by high school completion status in 2006. Eighty-eight percent (88%) of sophomores in 2002 had earned a high school diploma by 2006, compared to 4% who dropped out of high school but later received a GED and 8% with less than high school completion.

Table 2

Percentage of spring 2002 sophomores, by high school completion status in 2006

High school graduates		GED recipients		Non-completers ¹	
Percentage	SE	Percentage	SE	Percentage	SE
87.8	0.45	3.9	0.22	8.2	0.39

Note: Table values represent weighted, non-imputed data.

¹Includes students receiving a certificate of attendance, and those still enrolled in high school in 2006. Students receiving certificates of attendance and those still enrolled in high school in 2006 represent approximately one percent of the unweighted study sample.

Table 3a presents the means and standard errors for each of the parental involvement variables, overall and by high school completion status. Among the four types of parental involvement that parents were asked to rate on a 4-point scale, overall (and across all high school completion categories) the highest averages were reported for parent participation in extracurricular activities with children ($M = 3.06$, $SE = .007$; see Appendix A-1 for 95% confidence intervals). That is, on average, parents reported being “sometimes” involved with their children’s extracurricular activities. Averages for the other 4-point composite variables follow: parent-school communication concerning children’s school problems ($M = 1.32$, $SE = .007$), school-initiated contact with parents ($M = 1.33$, $SE = .006$), and parent-initiated contact with school ($M = 1.37$, $SE = .006$). Overall, communication between parents and schools was infrequent (i.e., less than “once or twice” during

the school year). Parental advising – which was rated on a 3-point scale – averaged 2.27 points overall, with a standard error of .006.

Table 3a

Means and standard errors for parental involvement variables, by high school completion status in 2006

Parental Involvement Variable	Total		High School Diploma Recipients		GED recipients		Non-Completers ¹	
	M	SE	M	SE	M	SE	M	SE
Parent participation in extracurricular activities with children	3.06	0.007	3.08	0.007	2.94	0.035	2.85	0.027
Parental advising	2.27	0.006	2.28	0.006	2.24	0.032	2.15	0.028
Parent-school communication concerning children's school problems	1.32	0.007	1.26	0.006	1.76	0.059	1.80	0.041
School-initiated contact with parents	1.33	0.006	1.33	0.007	1.34	0.032	1.38	0.023
Parent-initiated contact with school	1.37	0.006	1.36	0.007	1.50	0.036	1.43	0.028
Parent participation in school functions	0.29	0.005	0.30	0.005	0.21	0.015	0.19	0.012
Parental aspiration for children's postsecondary education	5.32	0.016	5.38	0.156	4.97	0.075	4.83	0.061
Family rules for maintaining grade	0.82	0.005	0.82	0.005	0.81	0.027	0.81	0.023
Family rules for doing homework	0.93	0.004	0.93	0.004	0.91	0.018	0.93	0.012
Family rules for doing household chores	0.88	0.004	0.88	0.004	0.93	0.015	0.92	0.011
Family rules for watching television	0.65	0.007	0.64	0.007	0.63	0.039	0.69	0.021

Note: Table values represent averaged estimates from five imputed datasets.

¹Includes students receiving a certificate of attendance, and those still enrolled in high school in 2006. Students receiving certificates of attendance and those still enrolled in high school in 2006 represent approximately one percent of the unweighted study sample.

Parents' educational aspirations for their children were measured using a seven-point scale (ranging from less than high school graduation to Ph.D., M.D., or other advanced degree). On average, parents aspired for their children to at least graduate from college ($M = 5.32$), although this item appears to vary more across the sample ($SE = .016$) than the other parental involvement dimensions. To further examine this finding, I calculated parents' educational aspirations for their children, by race/ethnicity and SES. Table 3b shows the resulting means and standard errors. Compared to other racial/ethnic groups, the parents of Asian/Pacific Islander ($M = 5.76$, $SE = .036$) and black ($M = 5.55$, $SE = .040$) students reported the highest expectations for their tenth-grader (see Appendix A-2 for 95% confidence intervals). Table 3c shows that, after combining categories 5 (graduate from college), 6 (obtain master's degree or equivalent), and 7 (obtain PhD, MD, or other advanced degree) into one category (bachelor's degree or higher), the highest percentage was also observed for Asian/Pacific Islander students (94%). The percentage for black students (89%) was not statistically different from White, American Indian/Alaska Native, Hispanic, or students of two or more races (see Appendix A-3 for 95% confidence intervals).

Table 3b

Means and standard errors of parents' aspirations for their tenth grader's postsecondary education, by race/ethnicity and SES

Student Characteristic	Parents' aspirations for their tenth grader's postsecondary education ¹	
	M	SE
Race/ethnicity		
White	5.23	0.021
American Indian/Alaska Native	5.16	0.171
Asian/Pacific Islander	5.76	0.036
Black	5.55	0.040
Hispanic	5.34	0.037
Two or more races	5.32	0.072
Socioeconomic Status (SES) Quartile		
Lowest quartile	5.03	0.034
Second quartile	5.18	0.029
Third quartile	5.39	0.023
Highest quartile	5.70	0.020

Note: Table values represent averaged estimates from five imputed datasets.

¹Based on (BYPARASP) How far in school the parent wants their tenth grader to go, where

- 1 = Less than high school graduation
- 2 = High school graduation or GED only
- 3 = Attend or complete 2-year college/school
- 4 = Attend college, 4-year degree incomplete
- 5 = Graduate from college
- 6 = Obtain master's degree or equivalent
- 7 = Obtain PhD, MD, or other advanced degree

Table 3c

Percentage of spring 2002 sophomores whose parents aspired for them to attain a bachelor's degree or higher, by race/ethnicity and SES

Student Characteristic	Parents' aspirations for their tenth grader to attain a bachelor's degree or higher ¹	
	Percentage	SE
Total	86.42	0.451
Race/ethnicity		
White	85.74	0.601
American Indian/Alaska Native	81.93	4.597
Asian/Pacific Islander	93.64	0.910
Black	88.61	0.953
Hispanic	85.93	0.942
Two or more races	84.66	2.025
Socioeconomic Status (SES) Quartile		
Lowest quartile	77.77	0.951
Second quartile	82.46	0.863
Third quartile	89.94	0.583
Highest quartile	96.04	0.441

Note: Table values represent averaged estimates from five imputed datasets.

¹Based on (BYPARASP) How far in school the parent wants their tenth grader to go.

Categories 5, 6, and 7 (see descriptions below) were combined to produce these estimates.

- 1 = Less than high school graduation
- 2 = High school graduation or GED only
- 3 = Attend or complete 2-year college/school
- 4 = Attend college, 4-year degree incomplete
- 5 = Graduate from college
- 6 = Obtain master's degree or equivalent
- 7 = Obtain PhD, MD, or other advanced degree

Regarding family rules, the majority of parents reported having rules for their child in terms of maintaining grades (82%), doing homework (93%), doing household chores (88%), and watching television (65%).

A quick comparison of the 95% confidence intervals (see table A-1) for each estimate in Table 3a yields a number of other findings, including that the parents of students who received a high school diploma by 2006 (compared to GED recipients and non-completers) reported (1) slightly higher levels of involvement in their children's extracurricular activities, (2) higher levels of involvement in school functions, (3) slightly higher educational expectations for their children, and (4) slightly fewer instances of parent-school communication concerning children's school problems.

Intercorrelations among Study Variables

Table 4 presents estimates of the correlations between study variables. The two outcomes – high school completion and postsecondary attendance by 2006 – had a moderate positive correlation ($r = .35, p < .01$). Among the parental involvement variables, parent-school communication concerning children's school problems was negatively correlated with both high school completion

($r = -.19, p < .01$) and postsecondary attendance ($r = -.24, p < .01$). Parental aspirations for their children's postsecondary education was positively correlated with both high school completion ($r = .13, p < .01$) and postsecondary attendance ($r = .27, p < .01$). The remaining parental involvement variables had weaker – although in some cases statistically significant – correlations with the two outcome variables. The student background variables (sex and SES) significantly correlated with a number of study variables. However, SES was more strongly correlated with postsecondary attendance ($r = .34, p < .01$) than high school completion ($r = .19, p < .01$). Regarding intercorrelations between the parental involvement variables, I found correlations similar to those reported in Fan and Williams (2010), and like their work, I observed these correlations to be no larger than .50, indicating minimal risk of multicollinearity.

Table 5 shows the weighted, non-imputed, percentage of spring 2002 tenth graders who ever attended a postsecondary institution (PSI), by high school completion status in 2006. Overall, 71% of sophomores in 2002 had attended a PSI by 2006. However, a higher percentage of high school graduates (77%) had attended a PSI, compared to GED recipients (37%) and non-completers (11%).

Multivariate Analysis: High School Completion

The logistic regression models analyzing the effects of parental involvement, sex, race/ethnicity, and SES were significant in predicting high school completion by 2006 (via diploma or GED) both for the 2002 sophomore cohort overall ($F(18, 243.1) = 32.58, p < .001$) and for the subpopulation of non-diploma recipients ($F(18, 246.3) = 2.60, p < .001$). Specifically, table 6 shows that parent participation in extracurricular activities with children ($\beta = .31, p = .02$), parent participation in school functions ($\beta = .50, p = .03$), and parents' aspirations for their children's postsecondary education ($\beta = .13, p < .001$) demonstrated positive influences on high school completion among 2002 sophomores overall. Additionally, parent-school communication concerning child's school problems ($\beta = -.99, p < .001$) and family rules for doing household chores ($\beta = -.40, p = .03$) both exhibited negative effects. However, in the second model, after controlling for sex, race/ethnicity, and SES, none of the parental involvement variables significantly predicted GED completion among non-diploma recipients.

Table 4

Intercorrelations among study variables

Variable	1	2	3	4	5
1. High school completion by 2006 ¹	-				
2. Postsecondary attendance by 2006	0.35**	-			
3. Parent participation in extracurricular activities with children	0.11**	0.13**	-		
4. Parental advising	0.06**	0.10**	0.44**	-	
5. Parent-school communication concerning children's school problems	-0.19**	-0.24**	-0.04**	0.02*	-
6. School-initiated contact with parents	0.00	0.02	0.14**	0.16**	0.15**
7. Parent-initiated contact with school	-0.01	-0.01	0.19**	0.25**	0.35**
8. Parent participation in school functions	0.09**	0.18**	0.33**	0.24**	-0.03**
9. Parental aspirations for children's postsecondary education	0.13**	0.27**	0.11**	0.19**	-0.16**
10. Family rules for maintaining grade	0.02	0.01	0.13**	0.13**	0.04**
11. Family rules for doing homework	0.01	0.01	0.14**	0.14**	0.02
12. Family rules for doing household chores	-0.02*	-0.06**	0.14**	0.11**	0.04**
13. Family rules for watching television	-0.01	-0.03**	0.16**	0.16**	0.05**
14. Sex	0.03**	0.09**	-0.01	0.01	-0.13**
15. SES	0.19**	0.34**	0.23**	0.21**	-0.06**

*p < .05; ** p < .01

Note: Table values represent weighted, non-imputed data.

¹Includes high school diploma recipients and GED recipients

Table 4 (Cont'd)

Intercorrelations among study variables

Variable	6	7	8	9	10
1. High school completion by 2006 ¹					
2. Postsecondary attendance by 2006					
3. Parent participation in extracurricular activities with children					
4. Parental advising					
5. Parent-school communication concerning children's school problems					
6. School-initiated contact with parents	-				
7. Parent-initiated contact with school	0.47*	-			
8. Parent participation in school functions	0.24**	0.27**	-		
9. Parental aspirations for children's postsecondary education	0.03**	0.01	0.14**	-	
10. Family rules for maintaining grade	0.01	0.06**	0.05**	0.06**	-
11. Family rules for doing homework	0.04**	0.06**	0.07**	0.01	0.44**
12. Family rules for doing household chores	0.04**	0.06**	0.04**	-0.02	0.23**
13. Family rules for watching television	0.06**	0.10**	0.11**	0.03**	0.24**
14. Sex	-0.04**	-0.04**	-0.01	0.06**	-0.02
15. SES	0.14**	0.14**	0.31**	0.25**	-0.03*

*p < .05; ** p < .01

Note: Table values represent weighted, non-imputed data.

¹Includes high school diploma recipients and GED recipients

Table 4 (Cont'd)

Intercorrelations among study variables

Variable	11	12	13	14	15
1. High school completion by 2006 ¹					
2. Postsecondary attendance by 2006					
3. Parent participation in extracurricular activities with children					
4. Parental advising					
5. Parent-school communication concerning children's school problems					
6. School-initiated contact with parents					
7. Parent-initiated contact with school					
8. Parent participation in school functions					
9. Parental aspirations for children's postsecondary education					
10. Family rules for maintaining grade					
11. Family rules for doing homework	-				
12. Family rules for doing household chores	0.29**	-			
13. Family rules for watching television	0.25**	0.30**	-		
14. Sex	0.01	-0.01	-0.02	-	
15. SES	0.01	-0.04**	0.00	-0.04**	-

*p < .05; ** p < .01

Note: Table values represent weighted, non-imputed data.

¹Includes high school diploma recipients and GED recipients

Table 5

Percentage of spring 2002 sophomores who ever attended a postsecondary institution, by high school completion status in 2006

Total		High school graduates		GED recipients		Non-completers ¹	
Percentage	SE	Percentage	SE	Percentage	SE	Percentage	SE
70.9	0.67	77.3	0.58	37.3	2.71	10.7	1.27

Note: Table values represent weighted, non-imputed data.

¹Includes students receiving a certificate of attendance, and those still enrolled in high school in 2006. Students receiving certificates of attendance and those still enrolled in high school in 2006 represent approximately 1% of the unweighted study sample.

Table 6

Summary of logistic regression analyses for parental involvement variables predicting high school completion (via diploma or GED) by 2006, overall and among non-diploma recipients

Variable	Overall ¹		Non-diploma recipients ²	
Parent participation in extracurricular activities with children	0.31	*	0.08	
Parental advising	0.10		0.21	
Parent-school communication concerning children's school problems	-0.99	***	-0.11	
School-initiated contact with parents	-0.10		-0.34	
Parent-initiated contact with school	0.17		0.27	
Parent participation in school functions	0.50	*	-0.12	
Parental aspirations for children's postsecondary education	0.13	***	0.05	
Family rules for maintaining grade	0.22		0.11	
Family rules for doing homework	-0.11		-0.26	
Family rules for doing household chores	-0.40	*	0.20	
Family rules for watching television	-0.14		-0.26	
Sex				
<i>Male</i>				
Female	0.17		-0.81	
Race/ethnicity				
<i>White</i>				
American Indian/Alaska Native	-0.82	*	-0.13	
Asian/Pacific Islander	0.19		-0.44	
Black	-0.50	**	-0.50	*
Hispanic	-0.48	**	-0.60	*
Two or more races	-0.32		-0.01	
SES	0.88	***	0.56	***

*p < .05; ** p < .01; ***p < .001

Note: Table values (standardized regression coefficients) represent averaged estimates from five imputed datasets. Italics refer to reference categories.

¹Among the entire cohort of tenth graders in 2002.

²Among students who did not earn a high school diploma by 2006 (includes GED recipients, students receiving certificates of attendance, and students still enrolled in high school in 2006). Students receiving certificates of attendance and those still enrolled in high school in 2006 represent approximately 1 % of the unweighted study sample.

Table 7

Summary of logistic regression analyses for parental involvement variables predicting postsecondary attendance by 2006, overall and among non-diploma recipients

Variable	Overall ¹		Non-diploma recipients ²	
Parent participation in extracurricular activities with children	0.14		0.00	
Parental advising	0.09		0.15	
Parent-school communication concerning children's school problems	-0.92	***	-0.37	*
School-initiated contact with parents	-0.06		-0.16	
Parent-initiated contact with school	0.03		0.06	
Parent participation in school functions	0.79	***	0.95	*
Parental aspirations for children's postsecondary education	0.28	***	-0.01	
Family rules for maintaining grade	0.06		0.18	
Family rules for doing homework	0.14		0.02	
Family rules for doing household chores	-0.41	**	-0.44	
Family rules for watching television	-0.23	**	-0.08	
Sex				
<i>Male</i>				
Female	0.36	***	-0.06	
Race/ethnicity				
<i>White</i>				
American Indian/Alaska Native	-0.68	*	-0.51	
Asian/Pacific Islander	0.62	***	0.16	
Black	-0.18	*	0.08	
Hispanic	-0.10		0.10	
Two or more races	-0.35	*	0.16	
SES	1.01	***	0.77	***

*p < .05; ** p < .01; ***p < .001

Note: Table values (standardized regression coefficients) represent averaged estimates from five imputed datasets. Italics refer to reference categories.

¹Among the entire cohort of tenth graders in 2002.

²Among students who did not earn a high school diploma by 2006 (includes GED recipients, students receiving certificates of attendance, and students still enrolled in high school in 2006). Students receiving certificates of attendance and those still enrolled in high school in 2006 represent approximately 1% of the unweighted study sample.

Multivariate Analysis: Postsecondary Attendance

The logistic regression models analyzing the effects of parental involvement, sex, race/ethnicity, and SES were also significant in predicting postsecondary attendance by 2006 both for the 2002 sophomore cohort overall ($F(18, 306.0) = 66.14, p < .001$) and for the subpopulation of non-diploma recipients ($F(18, 249.7) = 3.00, p < .001$). Similar to the high school completion model, parent participation in school functions ($\beta = .79, p < .001$), and parents' aspirations for their children's postsecondary education ($\beta = .28, p < .001$) positively influenced postsecondary attendance among 2002 sophomores overall (see table 7). However, parent participation in extracurricular activities with children ($\beta = .14, p = .07$), was not a significant predictor. Also, among study variables, there were more statistically significant negative predictors of postsecondary attendance than for high school completion. Specifically, parent-school communication concerning children's school problems ($\beta = -.92, p < .001$) and family rules for doing household chores ($\beta = -.41, p < .01$) continued to show negative effects and another variable – family rules for watching television – also demonstrated a negative influence on postsecondary attendance for the cohort overall ($\beta = -.23, p < .01$). Among non-diploma recipients, the only significant positive predictor of postsecondary attendance (other than SES) was parent participation in school functions ($\beta = .95, p = .01$). The only significant negative predictor was parent-school communication concerning children's school problems ($\beta = -.37, p = .01$).

Discussion

In this study, I replicate the means and intercorrelations reported by Fan & Williams (2010) who also employed multiple imputation (mi) techniques to address missing data across the same ELS parental involvement, sex, and SES variables as used here. In their study, parental involvement was used to predict students' academic self-efficacy, engagement, and intrinsic motivation in English and mathematics. Although the Fan and Williams study used the MI Markov Chain Monte Carlo approach (available through the PROC MI command in the SAS 9.2 software package) and their analysis generated only three mi datasets (compared to the five mi datasets generated here), my results are similar to theirs for each of these variables (although Fan and Williams appear to have reported standard deviations, which differ from my weighted estimates of standard error).

The current study further extends the literature by examining how different aspects of parental involvement influence other educational outcomes, namely, high school completion and postsecondary attendance. The findings I report here suggest that explanations for student persistence through secondary school and on to college that depend solely on race, ethnicity, socioeconomic status, or other background characteristics are incomplete and miss other important factors (such as parental involvement) that also contribute to these outcomes. Similar to studies that examined the relationship between parental involvement dimensions and other outcomes – such as middle school dropout behavior (Rumberger, 1995) and students' self-efficacy and engagement in mathematics and English (Fan & Williams, 2010) – it appears that parents' educational expectations for their children also play a significant role in whether students from all backgrounds persist toward completion of high school and whether they attend a postsecondary institution. In terms of high school completion (by 2006) among the entire cohort of 2002 sophomores, in this study I also found parent participation in extracurricular activities and school functions to be significant positive predictors, while communication between parent and school about children's school problems and having family rules for doing household chores exhibited negative effects. With regards to

postsecondary attendance, parent participation in school functions was a positive predictor of overall cohort attendance at a PSI as well as separately among non-high school diploma recipients.

The only negative predictor shared between the overall cohort model and the non-diploma recipients model was parent-school communication about children's school problems. This finding is similar to the results reported by Fan (2001) when exploring a similar type of involvement among parents of high school-aged students. This specific parental involvement dimension, termed "Contact with School", was comprised of three survey items regarding parents' contact with their children's school about (1) academic performance, (2) academic programs, and (3) behavior. Fan observed that the students of parents who reported more frequent contact with the school also had lower initial academic performance, which may explain the negative relationship between parent-school contact and academic growth, as measured in Fan's study. Thus, it is not surprising that parent-school communication about children's school problems is significantly related to dropping out of high school and not enrolling in postsecondary education.

While I am not recommending that parents and schools avoid communicating about students' academic or behavior problems, consideration should be given to increasing the frequency of other kinds of parent-school communication and contact. Unfortunately, parents often face time pressures and competing demands for their attention, leading to families and schools only communicating when there is a problem. Over time, a pattern of negative interactions (and disagreements) between parents and schools develops (Epstein, 1996), which is counterproductive to the goal of increasing positive family-school engagement. For this, and possibly other reasons, teachers of adolescents should plan for earlier engagement with parents (i.e., before problems surface) using efficient and effective communication tools, such as email, Web sites, electronic discussion boards, and blogs, to reduce or eliminate this barrier (Mandara, 2009).

An explanation for the lack of significant associations in the non-diploma recipients model for high school completion (via GED) is not easily found. One consideration is that possibly other factors, not studied here, are influential in predicting GED completion among students who did not earn a high school diploma by 2006. For instance, in another analysis of GED recipients from this ELS cohort, Malkus and Sen (2012) found that when asked about their reasons for leaving high school, a higher percentage of GED recipients reported leaving for a school-related reason (91%) than either a work-related or family-related reason (29% and 26%, respectively). Among GED recipients, the highest reported school-related reasons for leaving high school were: leavers thought it would be easier to get a GED (48%), leavers did not like school (44%), leavers were getting poor grades or failing school (39%), or leavers had missed too many school days (39%). As to reasons for earning a GED, 66% of recipients cited a need to meet requirements for additional study (e.g., a two- or four-year degree or sub-baccalaureate credential).

These findings could inform future studies of influential predictors of high school dropout and GED completion. That is, students at risk of dropping out of school and not completing any secondary or postsecondary credential may benefit from parental involvement in their high school education and extracurricular activities but perhaps they would benefit even more from school interventions designed to address some of the most frequently reported reasons for dropping out. Take for example, research demonstrating the strong negative relationship between chronic absenteeism and students' academic achievement, high school graduation and post-secondary enrollment outcomes (Balfanz & Byrnes, 2012). To address this problem, state and local education agencies have begun to add measures of student attendance to "early warning" indicator systems used to identify students at risk of dropping out or falling behind in school. The extent to which these early warning systems and interventions could explicitly include ways to engage parents – and

then study the effects on high school completion – is a promising area for future research and policy development.

The finding that parental involvement in school functions positively predicts postsecondary attendance among GED recipients could be used to encourage continued parental engagement for high school dropouts who enroll in a GED program. Furthermore, although the percentage of GED recipients who attended a postsecondary institution by 2006 (37%) is lower than for high school graduates, the fact that more than a third went on to enroll in some type of postsecondary education should encourage policymakers and practitioners to target resources and support for more of these students to pursue higher education. In fact, evidence of successful programs that help students earn a GED credential and enroll in college are beginning to emerge. For example, a study of the Bridge to Health and Business program, which offers students a career-related GED curriculum, found that one year after enrolling in the program, Bridge students were much more likely than those pursuing traditional GED programs to have finished the course, passed the GED exam, and enrolled in college (Martin & Broadus, 2013). Future research should also study the postsecondary experiences of GED recipients in the ELS cohort to describe the range of options high school dropouts take advantage of and to what extent parental involvement may play a role in their success (or lack thereof).

Conclusion: Parental Involvement Matters in High School

The results presented here underscore the continued need for parental involvement once children reach high school. How to encourage and sustain effective levels of parental engagement is hard to prescribe, but the literature offers recommendations for parents, the federal government, and state and local educational agencies. For parents, the strategies that worked with their children in elementary school may not be as effective once the children reach adolescence. Therefore, research suggests that parents engage in more developmentally appropriate ways, such as communicating high expectations for their children's future (Chao & Hill, 2009). While, the current study and previous research overwhelmingly support the idea that parental expectations play a major role in a whole host of educational outcomes for children, this study also shows where high expectations, alone, may not be enough to propel students to reach their potential. That is, although I show here that (with the exception of Asian/Pacific Islanders), the parents of black students reported having the highest educational aspirations for their children in tenth-grade, being black was also associated with lower likelihoods of high school completion and postsecondary attendance, even after controlling for SES (see tables 6 and 7). To improve students' chances of success, research suggests that parents supplement their high expectations with actively assisting their children in planning for college (Chao & Hill, 2009). To the extent that parents are not familiar with the college planning process, schools should be working to provide this information and other skills to enhance the "college knowledge" of both parents and students. Other recommendations include augmenting the instruction and extracurricular activities that youth receive at school by enrolling them in afterschool tutorials, study groups, community sports programs, etc. However, given that high SES parents will likely have better access to these kinds of services than low SES parents, federal and locally-funded programs may be needed to offset costs, as well as provide transportation and other resources for high-needs children. Finally, research suggests that parental involvement in such activities as managing the homework of high school-aged children should shift from a supervisory role to more of a supportive one, as these youth become increasingly more independent and able to make decisions for themselves (Chao & Hill, 2009). However, learning to do this effectively takes skill, specifically in terms of knowing how to provide opportunities for youth to link schoolwork with

current events, how to monitor (rather than check) homework, and how to provide the autonomy for high school students to make decisions, while still setting boundaries around time use. This is another area where schools have a duty to coach and train parents about effectively engaging in their children's education.

As mentioned earlier, NCLB (and now ESSA) provided funding (through Title I) for parent engagement activities and required that schools provide parents with a written parental involvement policy that is based on parent input and leadership. The law also required that these policies be accessible to parents with limited English proficiency and that other reasonable support be provided (for more information, see section 1118 of NCLB or section 1116 of ESSA). However, these requirements are of little use if they are not informed by the local context. That is, one-size-fits-all approaches to increasing parental involvement will not work in all communities. To be effective for black and Latino parents and students, for example, some research suggests that school leaders first cultivate a school climate that welcomes and includes cultural diversity so that trust is established between parents, students, teachers, principals, and community members (Epstein & Sanders, 2002; Henderson & Mapp, 2002). In other words, for schools to succeed in engaging families from diverse backgrounds, more consideration must be given to practices that recognize, respect, and address the needs of individual families (as well as class and cultural differences between families), and that embrace a philosophy of partnership with shared responsibility and power.

Limitations

Most of the data used in this analysis were self-reported by students and their parents and, while typical of large-scale studies, this method of data collection can yield biased estimates due to participants providing socially-desirable or unreliable information. Furthermore, no causal conclusions can be made from the multivariate statistics presented here. Although I observed statistically significant associations between some aspects of parental involvement in 2002 and students' high school completion and postsecondary attendance by 2006, there are potentially other factors not studied which may have also influenced these outcomes. For instance, parents' aspirations for their children's educational attainment appears to have a strong influence on students' high school completion and postsecondary attendance (as well as on other educational outcomes, as shown in previous studies). However, this relationship is not in itself evidence that simply having high educational expectations for one's child, regardless of relevant student characteristics (e.g., prior achievement or behavior), will lead to favorable outcomes for him/her. It may be that student achievement or behavior in earlier grades may influence parents' educational expectations for their children in tenth grade. Future research should study parental expectations for tenth grade students across various student characteristics prior to tenth grade (e.g., ninth grade GPA, whether student had ever been held back a grade or suspended from school) and examine the possible mediating effects of these prior characteristics on the relationship between parents' educational aspirations for their children and students' high school completion and postsecondary enrollment. Finally, I found both positive and negative relationships between specific types of parental involvement and the educational outcomes studied here (high school completion and postsecondary attendance). The extent to which this narrow set of activities and behaviors accurately captures the most important aspects of parental involvement poses limitations for the study of this construct. Thus, the analysis presented here may underestimate the real contributions that parents make to their children's growth, development, and success during and after the high school years.

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Appendix A

Table A-1.

95% confidence intervals for mean estimates of parental involvement variables, by high school completion status in 2006

	Total	High School Diploma Recipients	GED recipients	Non- completers ¹
Parental Involvement Variable	[95% CI]	[95% CI]	[95% CI]	[95% CI]
Parent participation in extracurricular activities with children	[3.04, 3.07]	[3.07, 3.10]	[2.87, 3.01]	[2.79, 2.90]
Parental advising	[2.26, 2.28]	[2.27, 2.30]	[2.18, 2.31]	[2.10, 2.21]
Parent-school communication concerning children's school problems	[1.31, 1.34]	[1.25, 1.27]	[1.64, 1.88]	[1.72, 1.88]
School-initiated contact with parents	[1.32, 1.34]	[1.31, 1.34]	[1.27, 1.40]	[1.33, 1.43]
Parent-initiated contact with school	[1.36, 1.38]	[1.35, 1.37]	[1.43, 1.57]	[1.37, 1.49]
Parent participation in school functions	[0.28, 0.30]	[0.29, 0.31]	[0.18, 0.24]	[0.16, 0.21]
Parental aspirations for children's postsecondary education	[5.29, 5.35]	[5.35, 5.41]	[4.82, 5.11]	[4.71, 4.95]
Family rules for maintaining grade	[0.81, 0.83]	[0.81, 0.83]	[0.76, 0.87]	[0.76, 0.86]
Family rules for doing homework	[0.92, 0.93]	[0.92, 0.93]	[0.87, 0.95]	[0.90, 0.95]
Family rules for doing household chores	[0.88, 0.89]	[0.87, 0.89]	[0.89, 0.96]	[0.90, 0.95]
Family rules for watching television	[0.63, 0.66]	[0.63, 0.66]	[0.55, 0.72]	[0.65, 0.74]

Note: Table values represent averaged estimates from five imputed datasets.

¹Includes students receiving a certificate of attendance, and those still enrolled in high school in 2006. Students receiving certificates of attendance and those still enrolled in high school in 2006 represent approximately one percent of the unweighted study sample.

Table A-2

95% confidence intervals for mean estimates of parents' aspirations for their tenth grader's postsecondary education, by race/ethnicity and SES

Student Characteristic	Parents' aspirations for their 10th grader's postsecondary education ¹
	[95% CI]
Race/ethnicity	
White	[5.19, 5.27]
American Indian/Alaska Native	[4.82, 5.49]
Asian/Pacific Islander	[5.69, 5.83]
Black	[5.47, 5.63]
Hispanic	[5.27, 5.42]
Two or more races	[5.18, 5.46]
Socioeconomic Status (SES) Quartile	
Lowest quartile	[4.96, 5.09]
Second quartile	[5.12, 5.24]
Third quartile	[5.35, 5.44]
Highest quartile	[5.66, 5.74]

Note: Table values represent averaged estimates from five imputed datasets.

¹Based on (BYPARASP) How far in school the parent wants their tenth grader to go, where

- 1 = Less than high school graduation
- 2 = High school graduation or GED only
- 3 = Attend or complete 2-year college/school
- 4 = Attend college, 4-year degree incomplete
- 5 = Graduate from college
- 6 = Obtain Master's degree or equivalent
- 7 = Obtain PhD, MD, or other advanced degree

Table A-3

95% confidence intervals for percentage estimates of spring 2002 sophomores whose parents aspired for them to attain a bachelor's degree or higher, by race/ethnicity and SES

Student Characteristic	Percentage of tenth graders whose parents aspired for them to attain a bachelor's degree or higher ¹
	[95% CI]
Total	[85.51, 87.29]
Race/ethnicity	
White	[84.51, 86.88]
American Indian/Alaska Native	[71.12, 89.3]
Asian/Pacific Islander	[91.60, 95.21]
Black	[86.60, 90.35]
Hispanic	[83.97, 87.68]
Two or more races	[80.25, 88.23]
Socioeconomic Status (SES) Quartile	
Lowest quartile	[75.84, 79.58]
Second quartile	[80.69, 84.09]
Third quartile	[88.74, 91.03]
Highest quartile	[95.07, 96.82]

Note: Table values represent averaged estimates from five imputed datasets.

¹Based on (BYPARASP) How far in school the parent wants their tenth grader to go. Categories 5, 6, and 7 (see descriptions below) were combined to produce these estimates.

- 1 = Less than high school graduation
- 2 = High school graduation or GED only
- 3 = Attend or complete 2-year college/school
- 4 = Attend college, 4-year degree incomplete
- 5 = Graduate from college
- 6 = Obtain Master's degree or equivalent
- 7 = Obtain PhD, MD, or other advanced degree

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